Multilayer Laue Lenses for Nanofocusing of Hard X-rays

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Multilayers consisting of tungsten silicide on silicon bilayers that were grown with a graded thickness recipe to produce a linear zone-plate structure have been tested. The results to date have produced a focus of 72 nm for 19.5 keV x-rays on a bending magnet beamline at the Advanced Photon Source. The multilayer stack consisted of more than 10 microns of sputtered material, and the optical devices were made by dicing and polishing to produce wedges having an optical depth between 5 and 15 microns. In addition to the focusing behavior, Laue-case diffraction was studied. The structures have diffraction properties intermediate between Fresnel diffraction and volume diffraction.

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